

FSS 001190R

Passmore

FAA Form 2800-2 (1-65)

0052-642-5000

(1360)

REMINDER MEMO

➤ AVOID ERRORS — PUT IT IN WRITING ◀

DATE

August 9, 1973

WORK ORDER

TO:

ALL ATTENDEES - Meeting 7/26/73

ROUTING SYMBOL

SUBJECT:

Toxic Gas Emissions Project 181-521-03X
9550-1, AFS-100-73-134

Enclosed is a copy of minutes of meeting of July 26, 1973, after coordination with all services attending.

A followup meeting will be scheduled in September to review action taken on various items, and status of project as related to goals and timing in the 9550.

SIGNATURE

R. C. MCGUIRE

R. C. McGuire

ROUTING SYMBOL

ARD-522

Minutes of Meeting 7/26/73 at NAFEC on Toxic Gas Emissions, Project
181-521-03X (9550-1 #AFS-100-73-134)

August 8, 1973

1. ATTENDANCE

R. C. McGuire, ARD-522	G. Bates, ANA-1A
T. Horeff, ARD-522	H. Hansberry, ANA-400
N. Shapter, AFS-120	C. Middlesworth, ANA-420
H. Branting, AFS-120	G. Geyer, ANA-420
T. Sanford, AFS-23	G. Sarkos, ANA-420
J. Sirkis, AAM-130	E. Nicholas, ANA-420
H. Daiutolo, ANA-4b	J. Gassman, ANA-420

2. STATUS OF SMOKE/TOXIC GAS RULEMAKING NOTICES

AFS-120 reported that the proposed NPRM on smoke-limits will clear legal, and be reviewed by Regulatory Council on August 8, 1973. They expect to issue the notice about the second week in August. This represents a slippage of about one month over the date set at the meeting of May 2. This does not change target completion dates in the 9550-1. The Advance Notice on Toxic Gas Limits will be issued simultaneously. AFS-120 also plans to issue a new NPRM which would require all air-carrier jet transport interiors to be upgraded to the May 1972 flammability requirements, within three years.

3. STATUS OF PROCUREMENT OF TEST INSTRUMENTATION

ANA-420 reported that all necessary gas measurement instrumentation for the NBS Chamber phase of the project has been received except the IR Spectrophotometer which is expected to be delivered during the week of July 30. (Note: was delivered on July 31) The calibration solutions for the soluble gases which will be measured with the specific ION detector are also being procured. The CO gas analyzer is on hand; 120 colorimetric tubes for each gas to be measured have been received. It was stated that the colorimetric tubes have been improved by the manufacturer and are more accurate than the ones used during the materials flammability tests a few years ago.

Mr. Horeff stated that the University of Utah is conducting a toxic gas emissions/materials program similar to the FAA program. Mr. Sarkos said they are using gas chromatography and mass-spectrometer techniques in conjunction with a computer to identify, measure, and record gas emissions. After a lengthy discussion on the merits of these techniques as compared to the instrumentation planned for the FAA project, it was concluded that NAFEC would conduct their tests as planned because (1) the IR spectrophotometer, colorimeter tubes, specific ION electrodes and CO gas analyzer could provide the data needed to "grade" individual and composite/fabricated materials; (2) the NBS Chamber is based on a burning-area parameter using material thickness as installed in the airplane whereas measurement

of weight loss during combustion is not significant to analysis of toxic gas emissions, (3) the University of Utah project goals and test materials are similar but not identical to the FAA (4) the FAA program should be kept as simple as possible at this time to control work load and retain program completion dates, (5) the instrument methodology being used by University of Utah is essentially under development.

4. STATUS OF PROCUREMENT OF TEST MATERIALS

ANA-420 reported that many sample interior materials have been received from Boeing, Douglas, and Lockheed but these do not cover the range of materials supplied to FAA a few years ago for the smoke-tests. Additional materials are therefore being requested. A letter has also been sent to ten seat manufacturers for seat cushion and cover materials. Aerotherm's materials have been received. AFS-120 stated that more gas emissions data for "in-service" materials was needed in addition to the data already included in Report DS 68-16. It was decided that NAFEC would contact airlines and other agencies for samples of "used" jet transport materials. ANA-420 stated that they had written a letter (7-17-73) to the Society of Plastic Industries describing the FAA's toxic gas project and asking for their cooperation and support and support. The society is spending 3/4 million dollars on existing and advanced plastic materials research. AFS-120 recommended that the materials known to have the highest toxic emissions should be tested first. ARD-522 stated that the procurement of "used" materials had been discussed with Lockheed and United Airlines. It appears that UAL will respond to a formal request for such material; Lockheed stated that used materials might be available from Lockheed Aircraft Service and from NASA Houston B737 tests. ARD-522 stated that Weber Aircraft (seat manufacturer) had indicated willingness to cooperate. AFS-120 stated that American Airlines was refurbishing older jets and could be a source for service materials. AFS-120 will furnish ANA-420 with a list of materials in B-737 and DC-9 aircraft involved in crash fires in Chicago in December 1973.

5. STATUS OF NAFEC MANPOWER AVAILABILITY FOR TESTS

ANA-420 will assign five people (two engineers, three technicians) to the NBS Chamber test program for period July 73 to June 74; two people (1/2 man year technician, 1/2 man year engineer) will be assigned to the large-scale correlation test program during the same period. They will prepare a DC7 test fuselage for the project. The instrumentation used for the NBS tests will also be used for the large scale tests. Actual testing is scheduled to start in July or August 1974.

6. STARTING DATE FOR NBS CHAMBER TESTS

The NBS Chamber tests are scheduled to commence in September 1973. The detailed procedures for periodic sampling and measuring gases from the NBS Chamber are yet to be finalized. Tentative plan is to capture gas samples in plastic bags for follow-on laboratory testing. Decisions concerning contamination prevention, vacuum pump, gas

condensation and effect of sampling technique on performance of NBS Chamber have yet to be made.

7. TEST PLAN STATUS

ANA-420 stated that the draft test plan prepared on May 22, 1973, is essentially the final plan. ARD-522 commented on the literary character of the plan and recommended that separate plans dealing specifically with the NBS Chamber tests and large-scale correlation test should be prepared and distributed to all concerned. ARD-522 also recommended that the number of tests made on each material to demonstrate repeatability and correlation be determined by statistical methods. It appears that NAFEC's toxic gas test procedures will be similar to those used for smoke tests.

8. GASES TO BE MEASURED

ANA-420 listed the following gases which would be measured:

<u>GAS</u>	<u>COLORIMETRIC TUBE</u>	<u>SPECIFIC ION DETECTOR</u>	<u>IR PHOTOSPEC</u>
HCN	X	X	X(hi-concen. only)
HCl	X	X	X(" " ")
HF	X	X	X(" " ")
SO ₂	X	-	X(hi-concen. only)
H ₂ S	X	X	X(" " ")
NH ₃	X	X	X(" " ")
NO/NO ₂	X	-	X(" " ")
COCL ₂	X	-	X(" " ")
*CO	X	-	X(" " ")

*Also with CO gas recorder for continuous measurements.

9. CORRELATION TEST: LARGE SCALE FACILITY VS. NBS CHAMBER DATA

ARD-522 distributed copies of the draft work statement, stating that it was the basic performance requirement for the correlation task irrespective of the organization doing the work. The work statement is a modified version of the one prepared by John Marcy for the smoke correlation task accomplished by Lockheed. It was noted that Lockheed and NASA Ames have shown interest in this project. Although a group discussion to finalize the work statement was intended, ANA-420 stated that the task of correlating toxic gas data was not within the state-of-the-art. This was because of the many differences between combustion in a full scale cabin and that in an NBS Chamber; there were an infinite number of variables and conditions which could not be reckoned with; also the definition of correlation and the end-use of the results seemed vague.

ARD-522 stated that the task had been frequently discussed with NAFEC since February 1973 and these factors had not been raised. The discussion suggests that this requirement needs more analysis and a specific test plan. In view of NAFEC's exceptions to the correlation concept, AFS-120 stated that it would review the requirement in the 9550 and re-define their needs and objectives. ARD-522 recommended that this be done as soon as possible to keep the project on schedule (Note: ARD-522 is following this).

10. AAM/CAMI TOXICOLOGICAL TESTS

AAM-130 stated that CAMI planned to continue its studies of toxic gas effects on rats using the LD₅₀ criterion - which can be roughly extrapolated to human toxicity. Thus, although the CAMI activity is not directly related to the AFS-120 project, the resulting data will be generally applicable. However, it was agreed that the task of grading materials in terms of toxicity of their combustion products should be supported by adequate toxicological physiological data. AAM-130 was requested to investigate the possibility of initiating a project as soon as possible which would provide data on "Time-of-Useful-Function" for mice exposed to the individual gases listed above. The lethality (TUF) of the constituent gases produced by burning actual samples of a cabin materials could thus be assessed. The use of the TUF criterion instead of the LD₅₀ appears to a much better measure of the potential success of an emergency evacuation under post crash fire conditions. ARD-522 recommended that the large scale correlation test include TUF measurements based on exposing mice to the total smoke combustion product and that this portion of the program be administered by AAM-or CAMI.

11. SUMMARY - ACTION ITEMS

- (a) ANA-420 will expedite procurement of instrumentation and equipment, and additional cabin materials, including "service" materials, and seat materials.
- (b) ANA-420 will finalize detail test procedures for the NBS Chamber/ gas sampling test, etc.
- (c) AAM-130 will investigate possibility of conducting TUF test program with gases to be measured by ANA-420 (Note: AAM-130 states that this should be handled by a Form 9550).
- (d) AFS-120 will redefine the full-scale correlation test requirement in the 9550.
- (e) ARD-522 will assist ANA-420 as required and coordinate activities of AAM-130, AFS-120, and ANA-420 .

12. RECOMMENDATIONS

It is recommended that representatives of all services concerned with this project meet at least every 60 days to keep current with the project.


R. C. MCGUIRE